

What is claimed is:

1. A method for the post-treatment of exhaust gas produced by an internal combustion engine (1), particularly in a motor vehicle, wherein
  - a hydrolysis unit (10) connected to a water tank (19) is provided to obtain hydrogen, and
  - a quantity of hydrogen depending on a demand for hydrogen occurring at certain operating states and/or functions of the catalytic converter delivered to the untreated exhaust gas (A) and/or the exhaust gas treated by an oxidation catalytic converter is metered.
2. The method according to Claim 1, wherein the quantity of hydrogen required in each case is produced on demand in the hydrolysis unit (10) and made available directly for metering.
3. The method according to Claim 1, wherein a hydrogen tank (11) is provided that stores a certain quantity of the hydrogen produced by the hydrolysis unit (10).
4. The method according to Claim 3, wherein the quantity of hydrogen in the tank (11) is dimensioned so that it suffices to heat and regenerate an NOx storage catalytic converter (4).
5. The method according to one of the preceding claims, wherein the temperature ( $T_A$ ) of the untreated exhaust gas (A) and certain operating states of the catalytic converter system (3, 4) are registered.
6. An application of the method according to one of the Claims 1 through 5 to represent regeneration phases in an NOx storage catalytic converter, wherein hydrogen is added to the untreated exhaust gas at certain intervals and in the quantity required in each case.

1 7. The application according to Claim 6,  
2 wherein, with a diesel engine, the addition of hydrogen to the exhaust gas is  
3 activated when hydrocarbon cannot be produced using an internal process.  
4

5 8. The application according to Claim 6,  
6 wherein, with a gasoline engine, the addition of hydrogen to the exhaust gas is  
7 initiated when the engine operating point at the moment does not allow  
8 hydrocarbon to be made available using internal processes at a sufficient  
9 temperature.  
10

11 9. The application of the method according to one of the Claims 1 through 5  
12 to restore a sufficient conversion rate after sulphur poisoning at the oxidation  
13 stages of an NOx storage catalytic converter (4) or a particle filter (8) by  
14 regenerating the oxidation stages of the storage catalytic converter (4) or the  
15 particle filter (8) by means of hydrogen reduction.  
16

17 10. The application according to Claim 9,  
18 wherein regeneration is activated after the decrease in the conversion rate of the  
19 NOx storage catalytic converter (4) or the particle filter (8) is registered.  
20

21 11. The application of the method according to one of the Claims 1 through 5  
22 to raise the exhaust-gas temperature ( $T_A$ ) in order to guarantee the regeneration  
23 conditions are met when a particle filter (8) is employed while the engine  
24 operates under low-load conditions and temperature is therefore a crucial factor.  
25

26 12. An apparatus for the post-treatment of exhaust gas produced by an  
27 internal combustion engine (1), particularly in an internal combustion engine,  
28 wherein the following are provided: a hydrolysis unit (10) and a metering device  
29 (15) connected to it via a hydrogen line (17) for the metered addition of hydrogen  
30 to the untreated exhaust gas (A) and/or to the exhaust gas treated using an  
31 oxidation catalytic converter (3), and a control/regulating unit (18) that is

1 functionally connected to the hydrolysis unit (10) and the metering device (15) in  
2 order to control or regulate the production of hydrogen in the hydrolysis unit (10)  
3 and the metering device (15) as a function of certain operating states of the  
4 internal combustion engine (1) and registered parameters of the exhaust-gas  
5 system.

6  
7 13. The apparatus according to Claim 12,  
8 wherein the metering device (15) is a metering and shutoff valve.

9  
10 14. The apparatus according to Claim 12 or 13,  
11 wherein a hydrogen intermediate storage tank (11) is connected downstream of  
12 the hydrolysis unit (10) in order to store a certain quantity of hydrogen.

13  
14 15. The apparatus according to one of the Claims 12 through 14,  
15 wherein the control/regulating unit (18) comprises a catalytic converter  
16 monitoring function that is functionally connected to an exhaust-gas sensor  
17 system (5).

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